

ABSTRACT

A conical reactor head for use in chemical processes or other systems is provided. The reactor head includes a robust internal insulator to boost efficiency while maintaining safety by allowing the reactor head to self-radiate at high temperatures. The reactor head also includes a plurality of support lugs to protect its bottom flange from scratches or other damage when the reactor head is set on the ground. The reactor head is adapted to connect to a catalyst-containing barrel which is specially designed to facilitate easy installation and removal of catalysts or other equipment from outside the barrel. The reactor may be coupled with a rotation vane to induce laminar flow at the inlet of the reactor to increase reactor efficiency and prolong catalyst life.